much of his time in doing routine work unconnected with sciences, but he managed to make a great number of interesting observations, which he hastened to communicate to Professor Poulton in letters, along with specimens of most of the species referred to. He hoped, on returning home, to work up his results and publish his more important discoveries, but he lost his life through a collision at sea within a few hours of Liverpool. Professor Poulton has edited his letters, adding a brief memoir and numerous notes, together with a series of contributions, from specialists, describing many of the new or interesting species found.

The paper is so long, and its contents are so varied, that it is impossible to give an adequate summary. The principal section, however, refers to the transformations and habits of a number of species of Lycaenidae, and brings out a number of new and curious facts. It is a strange coincidence, that almost simultaneously with Dr. Wheeler's publication of the observation of beetles obtaining liquid nourishment from coccidæ in South America, Farquharson's account of similar habits in Lycænid butterflies in Africa appears. The butterfly concerned is *Teratoneura isabellæ,* a long account being given, showing that the attending ants are driven away, apparently by flapping the wings. Professor Poulton suggests that an offensive odor is also produced. Later, two other related butterflies, of distinct genera, were found to have the same habits. Unfortunately the coccids were not preserved, and we can only conjecture that they were some species of *Pseudococcus.* Both of the works reviewed were capable of being completed only by the cooperation of rather numerous specialists, entomologists and botanists. It becomes increasingly evident that much of the best work in bionomics must necessarily be cooperative, no single individual, however learned, being capable of dealing with all of the species and problems involved. It is pleasant to find, in the papers before us, that the desired assistance was freely given and is completely acknowledged. Only in this spirit is it possible for men to work harmoniously together, and any who fail to conform to proper standards should be made to feel the disapproval of their colleagues.

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## SPECIAL ARTICLES

### SEALING TUNGSTEN INTO PYREX

THE author has spent considerable time in evolving a good method of sealing tungsten wire into Pyrex and fastening the copper lead-wires to the tungsten. The method here described is easily accomplished and the freedom from breakage is certain. It is hoped that the present detailed description may save others sufficient time to justify its publication. An elementary knowledge of glass-blowing is assumed.

The sealing-in glasses and the order of joining are:

tungsten—G705H—G702P—Pyrex.

The numbers are used by the Corning Glass Company to designate these glasses. Some glass-blowers prefer to omit G705H and seal the tungsten directly to G702P. The G705H is of lower melting point, may be used in the gas-air flame and hence offers less chance to oxidize the tungsten.

Clean the wire by sandpaper only or warm in the flame, dip in a saturated aqueous solution of sodium or potassium nitrite (or nitrate) and then polish with very fine sandpaper or even the thumb nail. Draw small tubes of each of the three kinds of glass having an internal diameter slightly larger than the diameter of the wire. Cut a short length from each and string them on the wire in the order (above) in which they are to be sealed. The flame should be applied first to the middle of the G705H bead and the others in turn be brought along the wire and melted to the preceding one. The wire with its glass coating, Fig. 1-a, may then be sealed in in the usual manner but joining Pyrex to Pyrex. In case the tungsten wire is small and it is desired to protect it from the flame the Pyrex enclosing tube may be extended through the final seal, Fig. 1-b, and the excess glass broken off after the seal is accomplished.

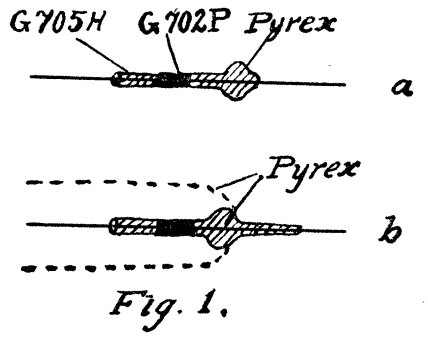


Fig. 1.

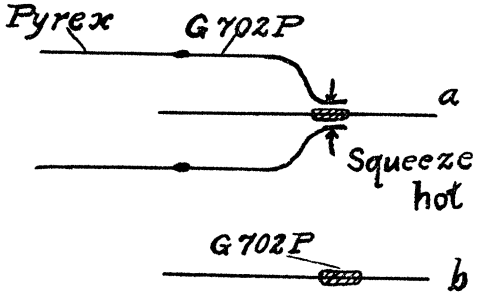


Fig. 2

A seal using only G702P and Pyrex may be made as indicated in Fig. 2. Join tube of G702P to Pyrex and draw down as indicated. The wire coated with a small bead of G702P (or even the bare clean wire) may be placed in position, Fig. 2-a, and the seal made by squeezing with tweezers when hot. Squeeze as soon as possible to prevent oxidation. This seal may also be made by squeezing a bead of G702P in a Pyrex tube but with less freedom from breakage.

To join copper to tungsten:

(a) electroplate tip of tungsten wire with copper or nickel and solder (silver solder for higher temperatures).

(b) melt nickel wire to tungsten in oxygen flame using borax as flux or even no flux. Nickel becomes very brittle and it is best to then solder to the nickel bead thus obtained.

(c) form arc of 10 to 20 amps. between tungsten and nickel wires to coat tungsten with nickel; solder.

(d) German silver (for this use of it I am indebted to Mr. Cummings of the Department of Chemistry of this University) flows much better than nickel. Use method (b) with borax as flux. Copper wire may be joined at once in flame just as in joining copper to platinum.

The method used will generally depend upon facilities available.

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## A NEW SCLEROTINIA ON MULBERRY

A DISEASE of mulberry characterized by enlarged portions of the fruit has been noted by Orton[1] and more recently by Taubenhaus.[2] The authors have found a species of Sclerotinia to be the cause of this disease and will describe it as follows in the *Journal of Agricultural Research:*

*Sclerotinia carunculoides* n. sp.

Apothecia one to several from a single sclerotium, disc cupulate to sub-cupulate; 4 to 12 mm. in diameter; inside snuff-brown,[3] outside Prout's brown; stalk cylindrical, flexuous, smooth, attenuated downward, 15 to 42 mm. in length, reaching a diameter of 1.5 mm., color Prout's brown; asci cylindrical to cylindro-clavate, 104 to 123 x 6.4 to 8 μ, average 117 x 7 μ, 8-spored; ascospores uni-seriate, reniform, hyaline, 6.4 to 9.6 x 2.4 to 4 μ, average 7.6 x 3.1 μ, with 2 bodies on the concave surface; namely, a body more or less rhombic in shape as seen from above, 2 x 4 μ, and adjoining it, a more or less hemispherical body 3 μ in its longest diameter; paraphyses filiform to cylindro-clavate, simple or branched, septate or non-septate, 94 to 128 x 1.8 to 2 μ; microconidia hyaline, sub-globose, 2 to 4 x 2 to 3.2 μ, average 2.8 x 2.5 μ; sclerotia black, fairly regular, sub-spherical with depressed surfaces.

[1] *Experiment Station Record,* Vol. XIV, No. 6, pp. 351-352, 1903.

[2] *Nature Study Review,* Vol. 17, No. 7, pp. 282-285, 1921. Illus.

[3] Ridgway, Robert, *Color standards and color nomenclature,* 43 p., 53 col. pl., Washington, D. C., 1912.